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Webometrics ranking of Universities: fallacy or reality

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ABSTRACT

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In recent years, the utilization of webometrics as a tool for ranking universities has gained significant traction, purportedly offering a comprehensive assessment of institutions' digital presence and impact. However, amidst its growing popularity, questions arise regarding the validity and applicability of webometrics rankings, particularly concerning universities situated in the global south. This paper critically examines the webometrics ranking system, aiming to discern its strengths and weaknesses while scrutinizing its efficacy in evaluating universities, particularly those in regions with diverse socio-economic contexts and digital infrastructures. The analysis begins by delineating the fundamental principles underlying webometrics rankings, highlighting its reliance on web-based indicators such as web presence, visibility, and transparency. While these metrics ostensibly offer insights into universities' global reach and influence, they also engender methodological complexities and biases. Notably, the dominance of older well-endowed institutions in comparison with younger resource-constrained institutions impeding equitable evaluation. Furthermore, the paper investigates the specific challenges faced by universities in the global south within the webometrics framework. Issues of digital divide, limited internet penetration, and disparities in web accessibility compound the difficulties faced by these institutions in attaining favorable rankings. Moreover, the emphasis on quantitative metrics overlooks qualitative aspects of academic excellence, neglecting factors such as research impact, teaching quality, and societal relevance, which are integral to universities' roles in diverse contexts. Through a critical lens, this paper underscores the fallacies inherent in the uncritical adoption of webometrics rankings as a singular measure of university performance. It advocates for a nuanced approach that acknowledges the contextual nuances and challenges faced by universities, particularly in the global south. By fostering a dialogue on the limitations of webometrics and exploring alternative evaluation methodologies, this research aims to contribute to a more inclusive and equitable framework for assessing higher education institutions in an increasingly digitized world.

Introduction

Webometrics ranking is a ranking system that measures the impact of an institution's online

presence and footprint. It is based on the size, visibility, and impact of an institution's web presence. The ranking system aims to promote the

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quality of research and education in academic institutions through visibility that showcases research activities and enriches knowledge. The relationship between webometrics ranking and quality of education is that webometrics ranking promotes the quality of education and research in academic institutions through visibility that showcases research activities and enriches knowledge. However, it is important to note that webometrics ranking is not a comprehensive measure of the quality of education and research in academic institutions.

The landscape of higher education evaluation has undergone a transformative shift with the advent of webometrics, a methodology that assesses the online presence and impact of universities. In recent years, the Webometrics Ranking of Universities has emerged as a prominent metric, aiming to quantify institutional influence and reach based on their digital footprint. This paper critically examines the validity and reliability of the Webometrics Ranking, probing the fundamental question: Is it a genuine reflection of academic excellence and influence, or does it perpetuate a fallacious representation of universities in the digital era?

As society becomes increasingly interconnected, the significance of a university's online presence cannot be overstated. The Webometrics Ranking purports to capture the global impact of institutions through the lens of web visibility, providing a numerical representation of their digital influence. However, this methodology raises several critical questions regarding its accuracy, relevance, and potential biases. This paper delves into these issues to unravel whether the Webometrics Ranking serves as a credible tool for assessing the diverse and multifaceted nature of higher education institutions.

Our investigation encompasses a multifaceted analysis of the Webometrics Ranking methodology, exploring its underlying assumptions, criteria, and the implications of its application. By critically examining the factors contributing to the rankings, we seek to ascertain whether webometrics

truly encapsulates the holistic essence of academic excellence or if it merely perpetuates a digital fallacy divorced from the intricate realities of educational institutions.

In the subsequent sections, we delve into the historical context of webometrics, the evolution of university rankings, and the unique challenges posed by the digital era. By scrutinizing the strengths and limitations of the Webometrics Ranking, this paper aims to contribute to the ongoing discourse surrounding the assessment of universities in the contemporary digital landscape, ultimately fostering a more nuanced understanding of the role and impact of webometrics on higher education evaluation

Problem Statement

The practice of ranking Ivy League universities alongside institutions in developing countries using the same metrics poses a significant fallacy, as it fails to account for the nuanced and diverse educational landscapes, resources, and socio-economic contexts within which these institutions operate. This oversimplified approach undermines the credibility of the rankings and hinders the accurate assessment of educational quality and impact.

One key issue arises from the significant diversity in resources. Ivy League universities, situated in developed countries, benefit from significantly higher financial investments, cutting-edge infrastructure, and research funding compared to institutions in developing countries. These disparities contribute to advanced academic programs, research facilities, and overall institutional capabilities. Failing to acknowledge these resource disparities can distort the perceived quality of education.

Traditional ranking metrics also pose challenges, particularly in the emphasis on research output and impact. While Ivy League universities may excel in certain research areas due to extensive resources, institutions in developing countries may prioritize community engagement, addressing local challenges, and fostering inclusive educa-

tion. Applying a uniform metric neglects these unique contributions. Furthermore, universities in developing countries often play a crucial role in addressing local needs, preserving cultural heritage, and contributing to sustainable development. Unfortunately, these aspects are not adequately captured in standardized ranking criteria, leading to an oversight of the institutions' real-world impact within their communities.

Metrics used in rankings may also overlook the accessibility and inclusivity of education. While Ivy League universities may enroll students from diverse backgrounds, institutions in developing countries face challenges related to affordability, infrastructure, and educational equity. Ranking them on the same scale overlooks the efforts made by these institutions to broaden access to education. In conclusion, a reevaluation of ranking methodologies is necessary to create a more nuanced and contextually relevant assessment of universities worldwide. By acknowledging and addressing these issues, a more accurate representation of the global educational landscape can be achieved, fostering a fair and comprehensive understanding of the diverse contributions made by institutions across different socio-economic contexts.

Discussion

Historical context of webometrics, The evolution of university rankings

The emergence of ranking systems can be traced back in 1865 to European studies that aimed to define whether environment or heredity was the determining factor in producing man of genius (Ismail, 2008:1). The purpose was to examine the quality of institutions and affiliated scholars in science and medicine whereby the results influenced the thinking of educators regarding quality assessment. During the twentieth century several evaluation and ranking systems for educational institutions appeared from time to time emerging with different aims and objectives. Webometrics coined in 1997 by Tomas Almind and Peter Ingwersen (1997), refers to the quanti-

tative analysis of activity on the World Wide Web like downloads that draws on informetric methods (Kousha et al., 2010). Introduction of the web impact factor (WIF) metric to assess the impact of the website or other area of the web based upon the number of hyperlinks relied on webometrics (Ingwersen, 1998).

Web impact factors seemed to make sense because useful or important areas of the web would presumably attract more hyperlinks than average. The logic of the metric was derived from the importance of citations in journal impact factors although web impact factor had the advantage of easily being calculated using the new advanced search queries introduced by AltaVista. Webometrics subsequently rose to become the large coherent field within information science from the bibliometric perspective (Zhao & Strotmann, 2008), encompassing link and web citation analysis as well as range of other web-based quantitative techniques. Modern form of educational ranking was originally introduced by United States News and World Report over two decades ago in order to publish transparent comparative data about the institutions.

The historical context of webometrics can be traced back to the late 20th century when the World Wide Web began to revolutionize information dissemination and accessibility. As the internet rapidly expanded, scholars and researchers recognized the need for innovative approaches to measure the impact of academic institutions beyond traditional indicators. The concept of webometrics emerged as a response to this need, focusing on the quantitative analysis of web-based activities and the online presence of universities. In the early 2000s, the emergence of search engines and web link analysis paved the way for the development of the first webometrics rankings, providing a novel perspective on evaluating universities based on their visibility and influence in the digital sphere. This marked a paradigm shift in the assessment of academic institutions, emphasizing the importance of their online engagement and impact alongside traditional metrics.

World Rank	Country	University	Impact rank	Openness rank	Excellence rank
1	USA	Harvard	1	1	1
2	USA	Stanford University	3	2	4
3	USA	Massachusetts Institute of Technology	1	3	15
4	USA	University of California Berkeley	4	4	27
5	UK	University of Oxford	15	5	5
6	USA	University of Michigan	8	10	8
7	USA	University of Washington	6	80	10
8	USA	Cornell University	5	15	23
9	USA	Columbia University, New York	9	7	18
10	USA	Johns Hopkins University	16	35	7

Table 1: *World Ranking of Universities—July 2023 edition*

Source: <https://webometrics.info>

The evolution of university rankings has seen a progression from primarily reputation-based assessments to more comprehensive methodologies that consider diverse factors.

Traditional rankings, often dominated by reputation surveys and academic citations, have faced criticism for their limited scope and potential biases. The advent of webometrics introduced a new dimension by incorporating web-based indicators, creating a dynamic and real-time assessment tool. However, this evolution has also introduced unique challenges. The digital era brings forth issues of data accuracy, algorithmic transparency, and the dynamic nature of online information. Universities now grapple with the need to manage and optimize their digital presence, posing challenges in balancing the pursuit of academic excellence with the demands of the evolving digital landscape. As the digital era continues to redefine the evaluation of universities, striking a balance between traditional academic metrics and web-based assessments becomes imperative for a holistic understanding of institutional performance.

Strengths and limitations of the Webometrics Ranking

The Webometrics Ranking emerges as a powerful instrument for universities in developing countries, providing a global platform to amplify their visibility and outreach. By accentuating

online presence, institutions can spotlight academic achievements, research output, and contributions to a wider audience. This digital avenue becomes particularly consequential in regions where traditional marketing and outreach resources are constrained, enabling universities to disseminate information about their academic programs and research initiatives, fostering the potential for international collaborations and partnerships. The real-time assessment feature of the Webometrics approach accommodates the dynamic nature of academic institutions in developing countries, allowing them to promptly showcase progress and contributions on a global scale.

Nevertheless, the strengths of the Webometrics Ranking are accompanied by considerations of potential limitations. Language bias and a predominant emphasis on research metrics may inadvertently disadvantage institutions in developing countries that prioritize community engagement, address local challenges, and contribute to non-traditional impact areas. To ensure a comprehensive and equitable evaluation framework, it is imperative to navigate these limitations, recognizing the diverse strengths and impacts of universities in developing countries beyond the confines of conventional metrics.

As for whether it makes sense to rank universities using webometrics from both developed and

Continental Rank	World Rank	University	Impact Rank	Openness Rank	Excellence Rank
1	246	University of Cape Town	284	235	293
2	398	University of the Witwatersrand	657	379	408
3	438	Stellenbosch University	696	350	471
4	450	University of Pretoria	597	506	499
81	2490	Moi University	4034	1791	3128
153	3475	Maseno University	5381	2172	4372
158	3614	Strathmore University Nairobi	2732	4324	4900
173	3866	Technical University of Kenya	6477	2843	4423
223	4693	Masinde Muliro University of Science & Technology	9558	2878	5104
374	7120	Meru University of Science and Technology	7406	4383	7237

Table 2: Africa Universities webometric Ranking —July 2023 edition

Source: <https://webometrics.info>

developing countries, there are criticisms about the function of webometrics ranking. Some argue that webometrics ranking is biased towards institutions in developed countries, as they tend to have more resources and a stronger online presence. Others argue that webometrics ranking is not a reliable academic ranking, as it does not take into account the quality of research and education in academic institutions. Therefore, it may not make sense to rank universities using webometrics from both developed and developing countries.

Table 1 presents the January 2023 Edition of the Webometrics ranking. It is observable that among the top 10 (ten) universities in the world, all except University of Oxford (UK) are from the United States of America. Going further, among the top 100 (One hundred) universities in the world only 46 (forty-six) are from other countries. The United States of America has 54 (Fifty-four) out of the top 100 (One hundred). Among the top 100 (One hundred) none is from Africa and none also from the developing countries.

Coming back to Africa (Table 2), University of Cape Town in South Africa is ranked as the best in

the African continent with a world ranking of 246 (Two hundred and forty-six). Following University of Cape Town as the second best university in Africa is University of the Witwatersrand ranked 398 (three hundred and ninety-eight) also from South Africa. Stellenbosch University also from South Africa comes at number 3 (Three) in Africa and at 398 (three hundred ninety-eight) worldwide. At number 4 (four) is University of Pretoria also from South Africa. In the African continent Cairo University from Egypt is ranked number 5 (five) and 548 (five forty-eight) worldwide. It is worth noting that among the top 10 (ten) universities in Africa only Cairo University and Alexandria University ranked at number 6 (six) and 584 (five hundred eighty-four) worldwide both from Egypt, are from outside South Africa. University of Kwazulu Natal from South Africa comes at position number 7 (seven) in the African Continent and 598 (five ninety-eight) worldwide. In Africa, University of Johannesburg from South Africa comes at position number 8 (eight) and 653 (six hundred fifty-three) in the world. At position number 9 (nine) in Africa is University of South Africa from South Africa ranked at 795 (seven ninety-five) worldwide. Clos-

ing the top ten is University of the Western Cape also from South Africa ranked 927 (nine hundred twenty-seven) worldwide.

From the above analysis, it is crystal clear that among the top ten universities in the African continent, 8 (eight) are from South Africa and 2 (two) from Egypt. Looking at the world ranking where the United States of America as 54 % of the top hundred slots of the best universities in the world, it follows that the level of economic development determine she level of ranking of universities in the world. In Africa, South Africa is rated above all the African countries in terms of economic development, hence the 80% of the top ten universities in the continent are from there. This therefore begs the question, whether universities should be lumped together when being ranked or they should be ranked according to their level of development. To illuminate and illustrate on this, it would of interest to rank together the University of Oxford –United Kingdom, which the second oldest University in the world, having been established in 1096 A.D (the oldest modern university is the University of Bologna in Italy-established 1088 A.D) with Meru university of Science and Technology-Kenya which was charted in 2010. It is worth noting that University of Oxford–UK is ranked number 5 (Five) worldwide.

Conclusion

In conclusion, the endeavor to rank Ivy League universities and institutions in developing countries using identical metrics represents a fallacy that undermines the integrity and fairness of higher education assessments. The inherent disparities in resources, both financial and infrastructural, create an uneven playing field from the outset. Ivy League universities, situated in developed nations, benefit from substantial financial investments, cutting-edge infrastructure, and extensive research funding, which significantly elevate their academic capabilities. In contrast, universities in developing countries grapple with limited resources, often facing challenges related to funding, infrastructure, and access to modern technol-

ogies.

Socio-economic contexts further compound the fallacy of uniform ranking metrics. The diverse environments within which these institutions operate impact their ability to provide quality education. Political stability, economic development, and access to technology significantly influence the overall learning environment. By disregarding these contextual differences, traditional ranking metrics oversimplify the assessment of educational excellence and inadvertently perpetuate a distorted narrative.

The overemphasis on standardized metrics, particularly those related to research output and international visibility, disregards the distinct missions and contributions of universities in developing countries. These institutions often prioritize community engagement, address local challenges, and play a pivotal role in sustainable development. Consequently, applying a uniform metric fails to capture the unique and multifaceted impacts of these universities, relegating their contributions to the periphery of the global academic discourse.

In conclusion, recognizing the fallacy in ranking Ivy League universities alongside institutions in developing countries is pivotal for fostering an accurate and equitable evaluation of higher education globally. A more nuanced approach that considers the diverse contexts, missions, and contributions of universities is imperative for a comprehensive understanding of their true value. Embracing a more inclusive and context-sensitive assessment framework will not only rectify the current fallacy but also contribute to a more accurate representation of the global educational landscape, valuing the diverse strengths and impacts of institutions across different socio-economic contexts.

References

Aguillo, I. F.; Granadino, B.; Ortega, J. L.; Prieto, J. A. (2006). Scientific research activity and communication measured with cybermetric indicators. *Journal of the American Society for the*

- Information Science and Technology, 57(10): 1296 - 1302.
- Aguillo, I. F.; Granadino, B.; Ortega, J.L. & Prieto, J.A. (2005). What the Internet says about Science. *The Scientist*, 19(14):10, Jul. 18, 2005.
- Aguillo, Isidro F., Ortega, J. L., & Fernández, M. (2008). Webometric Ranking of World Universities: Introduction, Methodology, and Future Developments. *Higher Education in Europe*, 33 (2/3), 233–244. <https://doi.org/10.1080/03797720802254031>
- Annum, G. Y. (2022). Cybermetrics Higher Educational Institution (HEI) Ranking Strategies: Useful Lessons for HEI's in Ghana to Adopt. *Open Journal of Social Sciences*, 10(6), Article 6. <https://doi.org/10.4236/jss.2022.106005>
- Arunachalam, S. M., Koumpis, A., & Handschuh, S. (2018). Webometrics: Some Critical Issues of WWW Size Estimation Methods. *Multimodal Technologies & Interaction*, 2(2), 1–11. <https://doi.org/10.3390/mti2020012>
- Bramer, W. M., de Jonge, G. B., Rethlefsen, M. L., Mast, F., & Kleijnen, J. (2018). A systematic approach to searching: An efficient and complete method to develop literature searches. *Journal of the Medical Library Association : JMLA*, 106 (4), 531–541. <https://doi.org/10.5195/jmla.2018.283>
- Cothey V, Aguillo IF & Arroyo N (2006). Operationalising “Websites”: lexically, semantically topologically?. *Cybermetrics*, . <http://cybermetrics.cindoc.csic.es/articles/v10i1p4.pdf>
- Farashi, S., & Bashirian, S. (2021). A complementary webometric ranking system based on the website quality and traffic measures: A study focusing on top-ranked world universities. *Education for Information*, 37(3), 337–354. <https://doi.org/10.3233/EFI-200422>
- Govender, K. K., & Nel, E. (2021). Ranking of Universities in the United Arab Emirates: Exploring a Web-Based Technique. *South African Journal of Higher Education*, 35(4), 58–77. <https://doi.org/10.20853/35-4-4104>
- Jacobs, D. (2023). Demystification of Bibliometrics, Scientometrics, Informetrics and Webometrics.
- Khamala, D., Makori, E., & Njiraine, D. (2018). Webometrics Ranking and Its Relationship to Quality Education and Research in Academic Institutions in Kenya. *Library Philosophy and Practice (e-Journal)*. <https://digitalcommons.unl.edu/libphilprac/2020>
- Kretschmer, H. & Aguillo, I. F. (2004). Visibility of collaboration on the Web. *Scientometrics*, 61 (3): 405-426.
- Kretschmer, H. & Aguillo, I. F. (2005). New indicators for gender studies in Web networks. *Information Processing & Management*, 41 (6): 1481-1494.
- Kumar, S. (2020). Can Webometrics Predict the Academic Rankings of Institutes? *Journal of Prediction Markets*, 14(2), 61–76. <https://doi.org/10.5750/jpm.v14i2.1816>
- Kunovic, S., & Zerem, E. (2019). *Scientometrics Recent Advances*. BoD – Books on Demand.
- Measuring Societal Impacts of Research with Altmetrics? Common Problems and Mistakes. (2021). *Journal of Economic Surveys*, 35(5), 1302–1314. <https://doi.org/10.1111/joes.12381>
- Mechanisms Used by Academic Libraries in Kenya to Enhance Webometrics Ranking | *African Journal of Education, Science and Technology*. (2023). <http://ajest.info/index.php/ajest/article/view/873>
- Memisevic, H., & Memisevic, M. (2022). Relationship between Webometrics University Rankings and Research Gate Scores, Scopus and Web of Science. *International Journal of Information Science & Management*, 20(3), 1–8.
- Ortega, J L; Aguillo, I.F.; Prieto, JA. (2006). Longitudinal Study of Contents and Elements in the Scientific Web environment. *Journal of Information Science*, 32(4):344-351.
- Sarwar, R., Zia, A., Nawaz, R., Fayoumi, A., Aljohani, N. R., & Hassan, S.-U. (2021). Webometrics: Evolution of social media presence of universities. *Scientometrics*, 126(2), 951–967. <https://doi.org/10.1007/s11192-020-03804-y>

- Thelwall, M. (2012). A history of webometrics. *Bulletin of the American Society for Information Science and Technology*, 38(6), 18–23. <https://doi.org/10.1002/bult.2012.1720380606>
- Thelwall, M., & Kousha, K. (2015). Web Indicators for Research Evaluation. Part 2: Social Media Metrics: Indicadores web para evaluación de la investigación. Parte 2: Métrica de medios sociales. *El Profesional de La Información*, 24(5), 607–620. <https://doi.org/10.3145/epi.2015.sep.09>
- Thelwall, M., & Vaughan, L. (2004). Webometrics: An introduction to the special issue. *Journal of the American Society for Information Science and Technology*, 55(14), 1213–1215. <https://doi.org/10.1002/asi.20076>
- Thelwall, M., Klitkou, A., Verbeek, A., Stuart, D., & Vincent, C. (2010). Policy-relevant Webometrics for individual scientific fields. *Journal of the American Society for Information Science & Technology*, 61(7), 1464–1475. <https://doi.org/10.1002/asi.21345>
- Wouters, P.; Reddy, C. & Aguillo, I. F. (2006). On the visibility of information on the Web: an exploratory experimental approach. *Research Evaluation*, 15(2):107-115.
- Yakymenko, I., Kazymyr, V., & Lytvyn, S. (2020). Webometrics ranking analysis and possible ways to improve the position of the university. 2020 IEEE 11th International Conference on Dependable Systems, Services and Technologies (DESSERT), 422–426. <https://doi.org/10.1109/DESSERT50317.2020.9124999>